# 76539

## Aphanitic High-Ti Mare Basalt
## 14.8 g, 3 x 2 x 1 cm

### INTRODUCTION

Phinney et al. (1974) and Simonds and Warner (1981) find that 76539 is a typical Apollo 17 mare basalt sample.

### PETROGRAPHY

Sample 76539 is an aphanitic mare basalt (Fig. 1). This basalt sample has about 15% skeletal olivine (Fig. 2) and ~10% skeletal ilmenite (Fig. 3), in quenched basaltic glass. It has no zap pits on the surface and only a few small vugs.

### WHOLE-ROCK CHEMISTRY

Rhodes et al. (1976a) and Wiesmann and Hubbard (1975) have determined the composition of 76539 (Table 1). It is typical of other high-Ti mare basalts from Apollo 17 (Fig. 4).

### RADIOGENIC ISOTOPES

Nyquist et al. (1975) have reported whole-rock isotopic data for 76539 (Table 2).



Figure 1: Photograph of 76539. Scale bar is marked in mm. S73-19606.

Figure 2: Photomicrograph of thin section 76539, 10, showing transparent skeletal olivine and opaque matrix.
Field of view is 2 x 3 mm.
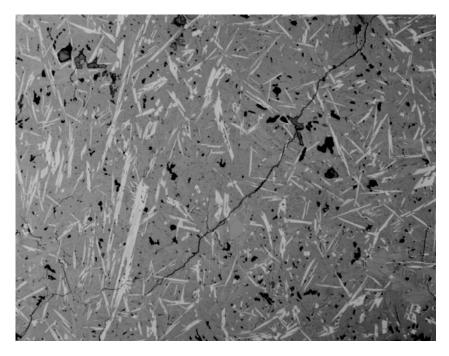


Figure 3: Reflected light photomicrograph of same area as Fig. 2, showing abundant skeletal ilmenite.
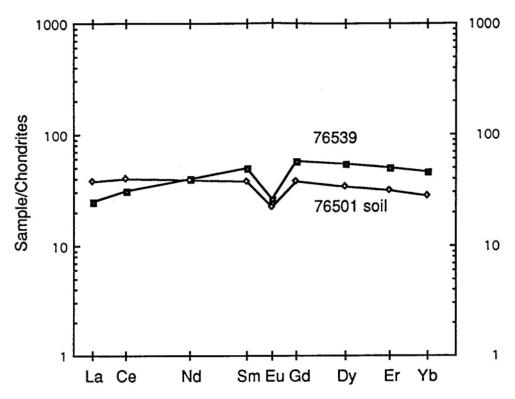Field of view is 2 x 3 mm.

Figure 4: Normalized rare earth element diagram from 76539, showing pattern typical of high-Ti Apollo 17 mare basalts.

**Table 1: Whole-rock chemistry of 76539.**
From Rhodes et al. (I 976a); Wiesmann and Hubbard (1975).

| Split Technique | ,3 XRF, IDMS | Split Technique | ,3 XRF, IDMS |
|---|---|---|---|
| $SiO_2$ (wt%) | 38.21 | Sr | 130 |
| $TiO_2$ | 12.65 | Rb | 0.383 |
| $Al_2O_3$ | 8.80 | Li | – |
| $Cr_2O_3$ | 0.34 | Ba | 64.8 |
| FeO | 19.42 | La | 5.88 |
| MnO | 0.29 | Ce | 18.6 |
| MgO | 7.87 | Nd | 18.3 |
| CaO | 10.91 | Sm | 7.32 |
| $Na_2O$ | 0.39 | Eu | 1.48 |
| $K_2O$ | 0.06 | Gd | 11.3 |
| $P_2O_5$ | 0.10 | Dy | 13.3 |
| S | 0.16 | Er | 8.02 |
| Nb (ppm) | | Yb | 7.40 |
| Zr | 196 | Lu | 1.05 |

**Table 2: Rb-Sr composition of 76539.**
Data from Nyquist et al. (1975).

| Sample | 76539,3 |
|---|---|
| wt (mg) | 57 |
| Rb (ppm) | 0.383 |
| Sr (ppm) | 130 |
| $^{87}Rb/^{86}Sr$ | $0.0085 \pm 3$ |
| $^{87}Sr/^{86}Sr$ | $0.69967 \pm 6$ |
| $T_B$ | $4.7 \pm 0.7$ |
| $T_L$ | $5.2 \pm 0.7$ |

B = Model age assuming I = 0.69910 (BABI + JSC bias)
L = Model age assuming I = 0.69903
(Apollo 16 anorthosites for T = 4.6 b.y.)